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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •

DECEMBER 8, 1934

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The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

Cellophane is lending itself to novelty fabrics for draperies and curtains.

An indicator has been developed to detect deterioration in canned goods.

There are more than 200 forms of black stem rust attacking different kinds of wheat.

A new metal polish comes in a tin can, in the form of a powder, to which water is added.

Automobile lens glass has been adapted to museum lighting, at the Museum of Fine Arts, Boston.

Science does not yet definitely know how the craters, plains, and mountains on the moon were formed.

Among the lessons found useful to 4-H farm club boys and girls are the tricks of tying various knots and handling rope.

Australia's freedom from serious epidemic diseases is attributed to the time taken for ships to reach her ports from infected countries, thus giving disease a chance to show itself before passengers reach Australian shores.

The hand of the great apes is more highly specialized than a man's hand, but man's foot is the more highly specialized.

The Japanese beetle, entrenched in twelve eastern states, made a new record for itself this year by appearing in Missouri and Indiana.

The U. S. Bureau of Plant Industry is requesting samples of nuts from the country's best nut-bearing trees, to aid in its work of improving stock.

The red cottage on the tuberculosis Christmas seal is the cottage at Saranac Lake, where Dr. Edward Trudeau initiated sanatorium treatment for this disease in 1885.

By "resilvering" its 27½ inch telescope mirror with aluminum instead of silver, the University of Michigan Observatory will increase reflecting power 50 per cent.

In excavating Dura on the Euphrates, archaeologists found human skeletons in some shops, suggesting that shopkeepers died defending their property or were burned to death in the Persian raid of 256 A.D.

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ARCHAEOLOGY

Home Life of "Folsom Man" Discovered in Colorado

In Steep Bank of Dried Arroyo Was Found a Camp Site Where Ancient Americans Rested After Mammoth Hunt

THE HOME life of America's oldest known humans has at last been uncovered.

In a steep bank of a dried-up arroyo in Colorado, a "prospector" of science has dug his way into a camp site and workshop of the most ancient Americans.

Thus the mysterious "Folsom hunters," whose trail of stone dart points has carried eager archaeologists to many an out-of-the-way place in the hope of new discovery, have been tracked home.

The discovery is announced by Dr. Frank H. H. Roberts, Jr., of the Bureau of American Ethnology in the Smithsonian Institution. Dr. Roberts has just returned from the important site, which he says he has merely prospected. The owner of the ground has posted it, warning off trespassers who might irreparably damage the prehistoric evidence, and the Smithsonian will renew excavations at the earliest opportunity.

The site, near the Colorado-Wyoming line north of Fort Collins, was detected when Dr. Roberts and an assistant were walking along the high bank of the dried stream. The assistant brought up a flint point, and showed where he had found it. Dr. Roberts probed the layer, buried 12 to 15 feet below the bank's surface, and the discoveries began.

Split Bones

That the place was one where the ancient hunters ate, worked, and rested is shown by many signs, plain to the archaeologist. Dr. Roberts found the bones of an assortment of animals, hacked and split for their marrow, just as the family circle would have left the remains of meals. What animals the bones represent, Dr. Roberts will ask paleontologists at the Smithsonian to determine. The bones are well on their way to being fossilized, and ring when struck like so much flint.

"We found not only Folsom type stone implements," said Dr. Roberts, "but we got the debris from the chipping and flaking, showing that the hunters worked as well as ate at this place. There was a lot of charcoal and ash among the implements, so there is no question that this was a habitation ground.

"I think the shelters or house remains are there, but we did not strike them in our digging. Nor did we find any human bones, though some of the hunters may be tucked away somewhere."

Very Ancient

The "Folsom complex," as the home life of the hunters would be technically called, will establish a new and more ancient chapter in American prehistory. Heretofore, Basket Makers have been the oldest inhabitants whose manner of life was known from their settlements, but the Indian Basket Makers are considered no older than 1500 or 2000 B.C. The Folsom hunters may go back five or ten thousand years earlier than this.

No pottery or baskets belonging to the hunters have been found. They may have had neither. Any skins or fragile materials used as containers would have long ago disintegrated from moisture, Dr. Roberts points out.

Attention of the Smithsonian was called to this region, when Prof. R. G. Coffin, geologist, of the Colorado Agricultural College wrote to tell of finding Folsom type points. Dr. Roberts set out for Colorado, and a quarter of a mile from the site where Prof. Coffin had found the flint weapons, the home of the elusive hunters was discovered.

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WHERE OLDEST AMERICANS WORKED AND ATE

The oldest home site in America is in this gully of northern Colorado where Dr. Frank H. H. Roberts, Jr., (shown in insert) discovered remains of the work and feasting of prehistoric men. Stone dart points, held by Dr. Roberts, show that these people were "Folsom Men" who lived contemporaneously with the mammoth, perhaps 10,000 B.C.

MEDICINE

Rheumatic Heart Disease Linked With Vitamin C

IT IS MUCH too soon to advocate oranges, tomatoes and cabbage for those who fear rheumatic heart trouble; but the U. S. Public Health Service reports experiments at the National Institute of Health in which "encouraging results have been obtained" linking the production of rheumatic-like heart lesions with vitamin C deficiency in guinea pigs.

Seizing upon the suggestion of University of California scientists, Drs. James C. Rinehart and Stacy R. Mettier, that a state of undernourishment approaching scurvy may contribute to the development of rheumatic heart disease, Dr. A. M. Stimson of the federal health bureau conducted research which seems to link the two conditions.

With characteristic caution, he says that "it cannot be stated that scurvy

is a factor predisposing to rheumatic infection," but adds that the results of his research justify going further in studies of the apparent relation between the two conditions.

Of course, it may be months or years before the discovery can be applied to human beings. Many additional laboratory and field investigations need to be conducted, Dr. Stimson says. Nevertheless he has obtained the following positive and "encouraging" results:

Guinea pigs were given scurvy by withholding vitamin C from their diet. They were then inoculated with hemolytic streptococci, "germs" thought to play a role in causing rheumatic heart disease. The animals developed heart lesions "somewhat comparable" to the most typical lesion of rheumatic disease found in man. Guinea pigs fed on diets lacking other vitamins but not lacking vitamin C did not develop these typical lesions after inoculating with the streptococci.

That is the story so far. When it is finished, vitamin C-containing fruits and vegetables or the vitamin itself, now made in the laboratory, may be able to play a conspicuous part in reducing deaths from heart disease.

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CHEMISTRY

Elements in Earth's Crust Caused by Cosmic Rays

New Hypothesis Suggests That Bombardment For Eons Of Time May Have Formed Them From Iron and Nickel

PENETRATING cosmic rays striking the earth for eons of time may have caused the formation of the varied elements, found in the top few miles of crust, from the supposed iron and nickel core. This is the suggestion of Prof. Gilbert N. Lewis, of the University of California.

Prof. Lewis' theory, entitled "The Genesis of the Elements," appears in the *Physical Review* (Nov. 15). Prof. Lewis is world-famous among chemists for his researches, among them the development, with Dr. Irving Langmuir, Nobel Prizeman, of the so-called Lewis-Langmuir atomic theory.

In summarizing his hypothesis, Prof. Lewis reports:

"The hypothesis is suggested that a great part of the matter in the universe is composed chiefly of iron and nickel, like the metallic meteors, and that such material which is thermodynamically stable with respect to all spontaneous transmutation, except at extremely high temperatures, is superficially attacked by cosmic radiation to produce the material represented by the earth's crust and by the stony meteors."

The metallic meteors consist of more than 99 per cent. iron and nickel, while the stony meteors are much less dense and are more like the rock of the earth's crust.

"It occurred to me," continued Prof. Lewis, "that if the crust of the earth, and especially if the stony meteors, are representative of the material produced by the disintegration of the primal substance of the metallic meteors, then there should be discernible some immediate genetic relationship between the abundance of the main atomic species of the stony meteors and of the metallic meteors."

Prof. Lewis has found striking agreement in his search for such relationships.

The analysis of metallic, iron, meteors reveals that over 99 per cent. of the mass present consists of two isotopes of iron and two isotopes of nickel. If cosmic rays had energies sufficient to split these iron and nickel atoms in half, two atoms of silicon would be formed for every atom of the twice-as-heavy iron and nickel atoms. Next to oxygen, silicon is the most prevalent element found in the earth's crust, and comprises more than a fourth of the mass of the crust.

In turn, suggests Prof. Lewis, the various isotopes of silicon might be disintegrated by cosmic rays to form magnesium and helium. Magnesium occurs widely, in combination, throughout the earth's crust in great abundance.

Counting three isotopes each of silicon and magnesium together with aluminum and sodium which, conceivably, could be formed in the two steps outlined, eight of the eleven most prevalent constituents of stony meteors are accounted for.

Concluding his report, Prof. Lewis states "It has been my purpose, not to erect any complete cosmological theory which would state the origin of the disintegrating rays, or where or when the material represented by the metallic meteors has been converted into the material represented by the stony meteors, but rather to present the very strong evidence for a genetic relationship between these two kinds of material, and to consider the various processes by which the genesis may have occurred."

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ARCHAEOLOGY

Empire of Trebizond Is Rediscovered

RE-WRITING history keeps scholars busy these days.

Last year, a Yale professor produced a learned volume showing that historians have overlooked a whole empire of the ancient world, a very powerful empire centered in Arabia.

Now, a University of Wisconsin professor returns from research in Europe to report that he is restoring a medieval empire to a place of importance in the world's story.

Losing whole empires out of history seems incredible. Yet, for four hundred years, the Empire of Trebizond has been so nearly forgotten that medieval specialists were about the only ones familiar with its name. Not even a recognized historical document survived from this empire. There were only casual references in Byzantine volumes. Trebizond looked almost unimportant.

Recently, however, Russian and English archaeologists have unearthed evidence giving Trebizond greater significance as a center of civilization. And Prof. Alexander A. Vasiliev of the University of Wisconsin, who has long been attracted by references to this neglected empire, determined to make a new search for its story.

Early this year, he was granted leave of absence to see what he could find in the manuscript crypts of European and Near Eastern museums, in the catacombs of monasteries and mosques, and the rare book vaults of foreign libraries. Discoveries from his research will appear in book form.

Trebizond began its existence as a

Greek colony 2,800 years ago, on the southern shore of the Black Sea in Asia Minor. The colony passed from Greece to Roman domination, then Byzantine, until the year 1204 A.D. when it proclaimed itself a new and independent empire. The empire lasted only until 1461, when Turkish hordes overran and conquered the country. So completely were people and culture absorbed that nothing of the old regime remained.

The significance of Trebizond, which Prof. Vasiliev stresses, is that it was essentially Greek in culture, from the beginning and straight through all its political history. Situated as it was in the path of well-trodden trade routes and military routes, Trebizond may have been a center from which Greek culture was transmitted to east and west, Prof. Vasiliev has reason to believe. Here, too, other cultures of the civilized world must have met and influences diffused.

Hence, Trebizond, so nearly lost and forgotten, may well be—says Prof. Vasiliev—the long sought link between western and eastern civilizations.

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MEASURING THE WARMTH OF A BREATH

With an instrument using as its essential part two wires "fine as a woman's hair," Dr. Francis G. Benedict, director of the nutrition laboratory of the Carnegie Institution of Washington, measures temperature variations in the human breath. Inset: The "business end" of the instrument, enlarged so that the thermocouple wires may be seen.

PHYSIOLOGY

Warmth of Human Breath Now Precisely Measured

Delicate New Instrument Using Wires as Fine as Hair Thus Gives an Index to Temperature of Air in Lungs

THE lover, "sighing like furnace," immortalized in Shakespeare's seven ages of man, can at last have the calorific quality of these sighs accurately measured. So also can a temperature be taken on the gentler warmth of his lady's responding sighs, if any.

A scientific instrument so delicate that it can register the temperature changes that occur during a single breath was described by its originator, Dr. Francis G. Benedict, before the meeting of the National Academy of Sciences in Cleveland. Dr. Benedict is the director of the nutrition laboratory of the Carnegie Institution of Washington, with his headquarters in Boston.

The instrument is of the type known as a thermocouple. It consists essentially of a pair of slender wires of two different metals, delicately soldered together. Changes of temperature of the air surrounding this junction cause fluctuations in a current of electricity flowing through the instrument, and these can be translated into terms of temperature. The sensitiveness of any thermocouple is determined to a large extent by the slenderness of the wires; and Dr. Benedict describes those in his instrument as "fine as a woman's hair."

"We are able to record the temperature throughout an entire respiratory cycle," Dr. Benedict reported. "This is never a constant thing, but varies with the period of the respiratory cycle. The air inhaled passing over the junction cools it off very rapidly. Then as the air begins to be exhaled the temperature rises very rapidly and reaches approximate constancy, but this whole cycle is a matter of but two seconds.

"Even such a point as studying the temperature of the air leaving the nostril shows that there is a central air path which is rather warm, while a millimeter or two towards the side of the nostril gets you instantly into a cold zone, which may be an eddy current or still air, through which the warm blast passes out to the room.

"Theoretically there is no such thing as the temperature of expired air. There are two measurements of it, however. One is the maximum temperature of the expired air and the other is an attempt to measure the average temperature of expired air. This latter is extremely difficult and is proportional to the volume, and any temperature measured instantaneously must be applied to the volume at that moment leaving the mouth or nostril.

"It is in the first of these, however, that we are more particularly interested, that is, the maximum temperature of the expired air. This chiefly gives an index of the probable maximum temperature of the air in the lower part of the lungs. With careful control of respiration, that is, having a moderately deep inspiration taken, the breath held for about five seconds and then expelled through a tube, with the nose closed so that there is a slight resistance (and it takes about four seconds to expel it), one gets a very regular temperature. This has been found to be almost exactly one degree Centigrade below that of the body itself."

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PSYCHOLOGY

Expressive Hands

Emotions Are Betrayed By the Gestures of the Hands As Well as by Voice or Eyes, Experiment Shows

By MARJORIE VAN DE WATER

THE human hand has always been associated in the popular mind with the human emotions.

The clenched fist is linked in our minds with anger. The closed hand with greed. The outstretched palm with begging. The upraised folded hands with supplication. And the palm turned outward from the body with disgust or fear.

The hand has throughout the ages gathered about it a wealth of symbolism, and many customs are associated with it. The "hand of God" is a symbol of His supreme power. We shake hands as a gesture of friendliness. Hands laid upon the head are a symbol of benediction, and the "Laying on of hands," is a sacrament of the Church. And "holding hands" is an intimate expression of affection as meaningful as a kiss.

Though your face should be masked, your eyes hidden, and even the posture of your body be undisclosed to the observer, still your mood of the moment might be revealed to him if he could see your hands.

The extent to which even unanimated "still" photographs of the hands serve as a clue to the emotions is indicated by a series of experiments conducted by psychologists at Brown University, Dr. Leonard Carmichael and S. O. Roberts, and recently reported by them to the American Psychological Association.

Posed By Actor

A skilled actor of the old school was selected to pose for a series of photographs. Prof. Thomas Crosby was the actor. After careful rehearsal before a mirror, Prof. Crosby would assume a pose of fear, or anger, or thought, or whatever was selected for expression. Then instead of photographing his face or his entire figure, just the hands were taken as they projected through a dark curtain which hid the rest of his figure.

The photographs thus obtained were later shown to a group of judges to determine just what was the emotion being expressed.

No clue was given to the judges. They were not given a list of words to select one which applied to the picture before them. They were not given the smallest hint of what was intended by the pose. They were given a sheet of paper, ruled to provide thirty-five blanks, one for each of the thirty-five photographs. With it were the following instructions:

"On the paper before you are thirty-five blanks. On the screen will be shown thirty-five pictures of hands in various positions. Write on the appropriately numbered blank the best single word which seems to describe the emotional or other attitude which is being expressed by the individual whose hands you see. If absolutely necessary use more than one word in your description."

Student Judges

A group of students of Brown University, numbering 348, acted as the judges. Naturally, since they were entirely without restriction in the selection of words to describe the pictures, not all of them would hit upon the same term for the same picture. Yet a surprising amount of agreement was observed.

For the hands posed in the reverent attitude of worship, upraised with palms together, 75 per cent. of the 348 judges assigned the title "prayer." A pose intended to express entreaty, hands raised and fingers spread upward, was called pleading by more than half of those who named it.

A pose with hands clasped and forefinger tips touching, intended to express thoughtfulness, was correctly named by just a third of the judges who named it. Another pose with hands thrown up, intended to express surprise, was correctly named by 30 per cent. But another pose intended to convey the impression of bewilderment was judged by 30 per cent. to be a pose of fear.

"Might the large number of correct judgments be due to years of theater-going which have taught people to know that certain gestures are intended to indicate certain emotions?" Dr. Carmichael was asked.

WORSHIP

"Of course we cannot be sure," he replied. "But one fact brought out in connection with the experiment points to a genuine association of certain gestures or postures of the hands with certain emotions rather than a conventional meaning for the gestures.

"After the judgments had been recorded, two oral questions were asked, 'Have you ever had any experience in acting, either as an amateur or as a professional?' and 'Did you imitate the expression on the screen while seeking the word for your answer?'

Posed Themselves

"The answers to these questions revealed that a surprisingly large proportion, 81 per cent. of the men, and 88 per cent. of the women, did not judge the emotion expressed merely by looking at the hands, as you would guess at what a person is feeling by looking at his face. Instead, these persons first placed their hands in the positions shown in the pictures. Then they began to get a feeling of what was intended."

The psychologist William James once proposed the theory that it is the attitude that leads to the emotional feeling, not the emotion that results in the attitude. Thus, he argued that when we see a vicious dog, we first start running and then feel afraid. The faster we run, the greater the fear. If we were to put up a bold front and face the dog stolidly, we should then feel brave.

Such a theory seems to gain support from this observation that the judges gained their clue to the emotion expressed by the actor by the process of themselves assuming his pose.

About thirteen of the thirty-five poses were correctly named by the greater number of judges. Some, however, were difficult to put over without the aid of motion. One pose intended to express distrust looked to the observers like the kind of pressing down gesture you use when you are saying "Sh! Be quiet!" A gesture of scorn was judged to be surprise, one of haughtiness was thought to be fear, one of curiosity was considered merely pointing, assurance was mistaken for anguish, one of wistful appeal and another of admiration were mistaken for explanation, and one intended to convey the impression of critical superiority looked to the judges like nothing but scratching.

Correctly Interpreted

Prayer, grief, surprise, entreaty, thoughtfulness, disgust were poses which were correctly interpreted by the majority of the judges. Other poses suggested moods very similar to the one intended. The quietly folded hands intended to express resignation were thought to represent rest while the knotted hands meant to portray pain were called nervousness. The outspread palms of humility were considered to represent pleading, stubbornness was called anger, and the pounding fist of determination was judged to be emphasis.

One source of confusion to the judges is of particular interest to psychologists. Fear and anger were consistently mistaken for each other but not for any other emotion. One pose intended to express anger was judged to be fear, another, quite similar in appearnce but intended to express terror, was judged to be anger. Still a third, intended to portary strong anger, was judged to represent fear.

These "errors" are significant because of the fact that physiologically fear and anger are really one emotion. Scared and mad produce the same quickened pulse, rapid breathing, dilated eyes, and the same changes in blood chemistry. Both represent the defense reaction of a person threatened by danger.

Intellectual Difference

Modern psychologists have suggested that the only difference between the two emotions is an intellectual rather than an emotional one. When you are faced with an opponent or someone steps on your corns in the subway or "cusses you out" you feel this defensive emotion. If your mind says that you are equal to the situation, you interpret this emotion as anger, and are inclined to "sock him one" or use explosive language. If, on the contrary, you notice that he is a burly ruffian with a bulge rather like that made by an automatic under his coat, or if you recognize him as someone very powerful in the company which employs you, you are more likely to feel intimidated by his aggression. Your impulse will then be to get away from him with all possible speed.

An animal in terrified flight will, when cornered, turn and fight with great viciousness. The most violent crimes have been committed not alone by persons in blind rage but by those who have suffered from a terrific fear. So it may be that had the judges selected the words "violent emotion" or "tenseness" to describe the poses of both terror and rage they would have been more accurate.

That the appearance of the hands does provide a clue to the individual's mood seems evident from these experiments.

Servants of the Mind

Students of evolution have said that it is man's hands, enabling him to grasp and use tools and make countless delicate manipulations of his environment, that are responsible for his development from the level of his nearest of kin, the great apes.

Now it appears that man's hands, acting as the servants of his mind, also serve to speak the language of his emotions, cooperating with lips and eyes and mobile face to convey to fellow men what he is thinking and feeling.

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ORNITHOLOGY

Goose-Swan Hybrid Bred in Munich Zoo

A GOOSE-SWAN hybrid, with a gander for father and a swan for mother, has been bred in the Munich Zoological Park. The bird, a male, is intermediate in size between goose and swan, has a neck more swan-like than goose-like, but feathers closer to those of a goose. Next spring it will be given a goose for a mate, and the second-generation hybrids subjected to further study.

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WHAT DO THESE HANDS TELL?

The pose at the left, intended to portray thoughtfulness, was correctly judged by most. Terror, as portrayed by the second, and strong anger, in the third, were mistaken for each other. The one at the right intended for pain, was judged to indicate nervousness.

MEDICINE

Giant X-Ray Tube Proving Its Worth in Cancer Cases

FIRST reports of the results of treating cancer by powerful gamma rays from the giant 900,000 volt X-ray tube of the California Institute of Technology have been made by Dr. Albert Soiland, chief of the Soiland Clinic, Los Angeles.

"Encouraging" and "hopeful" are the words Dr. Soiland used in describing the results obtained with patients suffering from advanced cancer. Before the five-year treatment period is over, Dr. Soiland and associates feel, as do all scientific cancer workers, no definite conclusions can be drawn. No statistics of scientific value can be established before this period has passed, he stated in a report to the Oklahoma City Clinical Society.

For the past four years, however, a group of advanced cancer patients have been undergoing treatment at the institute in Pasadena where the giant tube is housed and at Dr. Soiland's clinic where there is now a similar tube.

"We have seen results in a few advanced patients with cancer which had not yielded to treatment with our lower voltages," is Dr. Soiland's conservative way of reporting the results of the first four years' work.

The shorter wavelengths of the rays from the big tube permit more of them to penetrate to the deeper layers of the body, he explained. This accounts for the following three distinct advantages over treatment by lower voltages. The period required for treatment is shorter; there is less skin irritation; and unpleasant stomach sensations are largely avoided.

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SEISMOLOGY

Equatorial Earthquake Recorded at Many Stations

A STRONG earthquake almost on the equator, on the other side of the world, was recorded by a number of observatories in the United States and its territories on Tuesday, Nov. 27, at 1:14 a. m., eastern standard time. Deciphering radio and wire messages sent to Science Service, seismologists of the U. S. Coast and Geodetic Survey located an approximate epicenter, apparently under the sea, in latitude 1 degree north, longitude 127 degrees east. This is near the coast of New Guinea.

Stations reporting to Science Service were those of Manila Observatory, Manila, P. I.; of the Jesuit Seismological Association at St. Louis University, St. Louis, Mo.; Canisius College, Buffalo, N. Y.; and Georgetown University, Washington D. C.; and of the U. S. Coast and Geodetic Survey at Honolulu, Sitka, and Tucson, Ariz.

The earthquake that shook Manila on Monday, Nov. 26, was apparently a submarine disturbance. A radiogram received by the U. S. Coast and Geodetic Survey from the Manila Observatory states its epicenter was about seventy miles southwest of the city, as nearly as could be determined. It does not seem to have been a shock of major severity, since no other observatories have reported detecting it.

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PALEONTOLOGY

Real Sea Serpent Swam Ancient Virginia Sea

REAL sea serpents once swam in the offshore waters near the present site of the national capital. They were, apparently, at least as large as the biggest living land snakes. But they never scared anybody, or got stories about themselves in the papers, because they lived sixty million years ago, long before the first human beings appeared.

Evidence for the existence of these ancient sea monsters has been turned over to the Smithsonian Institution in the shape of a single fossil vertebra, or backbone joint, picked up on Belvedere Beach, Va., by Dr. W. Gardner Lynn of the Johns Hopkins University. By comparing this one bone with those of living serpents, Dr. C. W. Gilmore of the U. S. National Museum has been able to make a size estimate of the extinct sea serpent. He judges it to have been perhaps about 25 feet long, and thick in proportion. That is about as big as a really large modern python, of which this Virginia sea serpent may have been a remote cousin, though not an ancestor.

Dr. Gilmore has named the monster *Paleophis virginianus*, which is Greco-Latin for "ancient Virginian serpent." It had some contemporaries almost as large as itself, two of which have been found in New Jersey and one in Alabama. They were all sea dwellers.

Science News Letter, December 8, 1934

IN SCIENCE

VETERINARY MEDICINE

Operations on Dead Animals Save Unborn Young Alive

CAESARIAN operations performed successfully on wild animals by an amateur at veterinary surgery, are reported from the San Diego Zoological Park.

The young animals thus brought forth prematurely into the world included two wood rats and three rabbits, it was revealed when Walter P. Terry of National City, Calif., offered his specimens to the zoo.

Several months ago, Mr. Terry said, he shot a rabbit and discovered she was carrying four unborn young. With his pocket knife the hunter obtained the babies. Three were raised by his wife with an eye dropper and milk-soaked cotton. Later, he related, he shot a wood rat in the same condition and saved two of the young.

"This sort of operation has been performed on dogs and cats, but I never heard of it before on wild animals," said Mrs. Belle Benchley, director of the Zoological Garden. The former pets of Mrs. Terry will be placed on display.

Science News Letter, December 8, 1934

ASTRONOMY

200-Inch Telescope Disk Successfully Poured

A SECOND 200-inch telescope mirror disk to replace the one cast last March, was poured on December 2 at the Corning Glass Works at Corning, N. Y. The event with its fiery furnaces and ladles of red hot glass was not witnessed by the public during the time of the actual pouring, which was a complete success.

The 200-inch disk when finally completed will be installed in the world's largest telescope to be located on Mt. Palomar, a site only recently selected, in southern California. Final grinding and polishing to an accuracy of a millionth of an inch will be done at the California Institute of Technology.

Science News Letter, December 8, 1934

NCE FIELDS

HORTICULTURE

New Hybrid Potatoes Resist Late Blight

POTATO late blight, one of the most serious of crop diseases, causing millions of dollars' worth of loss in wet years, bids fair to be eradicated if experiments now being conducted by Dr. Donald Reddick, plant pathologist of Cornell University, are finally successful.

Returning from a survey trip in the highlands of central Mexico, Dr. Reddick brought back several close relatives of the potato that are immune to the disease. These plants, grown in the University's greenhouses and gardens, were used as parents for crosses with the common potato.

About 200 blight-immune hybrids are being carried along in Dr. Reddick's experiments. From this list a dozen were selected that had the appearance of domestic varieties and bore from six to nine tubers of commercial size, white and smooth.

Science News Letter, December 8, 1934

ASTRONOMY

Moon's Surface Made Of Ash and Pumice

VOLCANIC ash and pumice. That is what the moon's surface is made of, if a Carnegie Institution of Washington committee of scientists have the correct evidence.

Green cheese has never been considered moon material except in nursery rhymes, but scientists have wondered whether the lunar landscape is made of dark, solid rocks like most of the earth's surface.

The reflected sunlight that reaches earth one and a quarter seconds after leaving the moon brings a message to scientists. Because it is relatively little polarized or set to vibrating in one direction, as it would be if it came from dense dark rocks, it is concluded that the moon rocks are like the light, translucent rocks and materials found around volcanoes here on earth. The rapidity with which the moon drops in temperature when the eclipse shadow of the earth sweeps over it also argues for a moon surface largely made of silica and produced by volcanism.

While the moon was once the scene of great catastrophic movements and crustal movements, it is "dead" in comparison with the earth. It is without air and water, and no protective blanketing atmosphere softens the impact of the sun's rays and prevents the escape of heat. Temperature fluctuates violently. Moon craters make earthly volcanoes dwarfs in comparison. Moon mountains are unlike earth mountains and geologists have difficulty understanding them. Moon mountain heights reach 25,000 feet and the deepest crater has a depth of 24,000 feet.

Four miniature moons have been prepared by the committee chairman, Dr. F. E. Wright of the Geophysical Laboratory, Washington, D. C. to facilitate the latest study of the moon. These globes are the world's first spherical photographic negatives, specially coated and fashioned for this research.

Science News Letter, December 8, 1934

RADIO

New Short Wave Station Opened at Harvard

A NEW short wave station, equipped with a beam antenna which allows the broadcasting of radio waves in a straight line, has been constructed on the roof of the physics building at Harvard University by Prof. Harry R. Mimno.

The experimental station operates on a wavelength of five meters. Its antenna can be elevated or depressed on a horizontal axis as well as turned from side to side. At present it is carrying on communication with the short wave stations at Blue Hill Observatory, Mass., and West Hartford, Conn.

Because short waves travel in optical lines, that is, in lines similar to beams of light, it was thought until recently that such waves could not go more than fifty miles due to the blocking effect of the horizon. Very rarely do short waves reflect from the Heaviside layer, according to Prof. Mimno. When it was recently found that the station in West Hartford, more than eighty miles away from Boston and across a range of hills, could receive the signals, new evidence was provided that indicates the short wave theory needs revision.

Science News Letter, December 8, 1934

BACTERIOLOGY

Babylon's "Solid Beer" Bacterially Brewed

"SOLID beer" was a standby of the Babylonians and ancient Arabs when they went on a long journey. Just what this stuff was, and how it was made, has been traced by Prof. Paul Lindner, Berlin bacteriologist, with the assistance of Dr. Engelbert Huber, student of the history of brewing.

The early Arabs, according to ancient texts, knew the "solid beer" under the name of "saviq"; their predecessors the Babylonians, gave it the more bubbly title of "hubur bulug gar." It was not sold by liquid measure, but in lumps by weight, and was carried wrapped up in packages on camel-back. When the caravan made camp, some of the lumps were soaked in water, which quickly fermented into a refreshing drink of low alcoholic content.

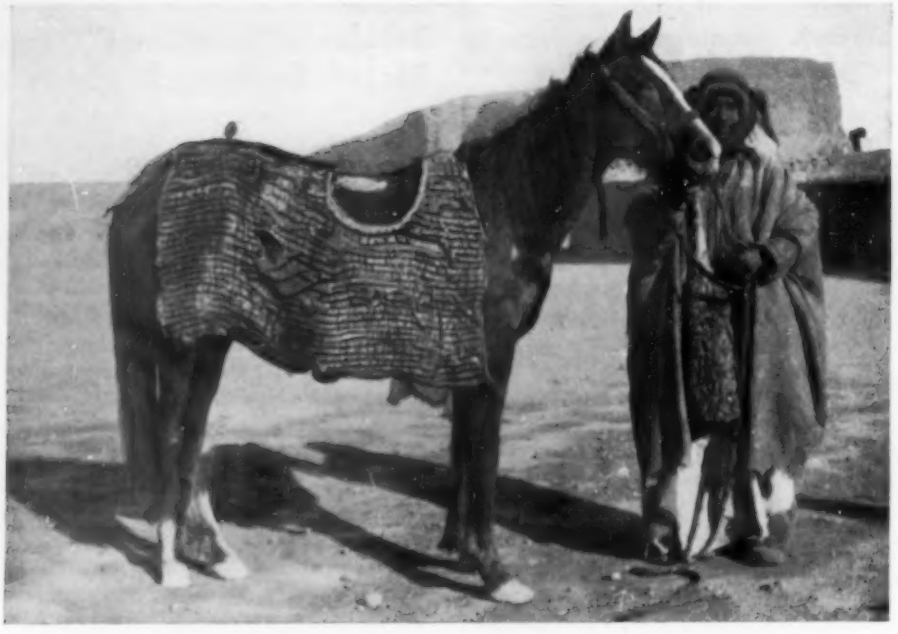
The lumps of "solid beer" appear to have been made of a special kind of bread, in which barley malt was a prominent ingredient, and frequently containing also a considerable proportion of sweet date pulp. This bread was baked at a moderate temperature on hot stones, and then packed up.

The quick fermentation, Prof. Lindner is convinced, was due to the action not of yeasts but of a species of bacterium which he himself discovered and identified some years ago, known as *Termobacterium mobile*. It is found in warm regions throughout the world, and plays a leading part in the quick fermentation of the milder beers made of palm sap and other ingredients by primitive peoples. Prof. Lindner believes that this bacterium would either be left unkilled by the mild baking of the "saviq," or that it would readily find its way into the mash made by soaking it in water.

The art of making "saviq" has apparently been lost by the town-dwelling Arabs of the Near East, but it may possibly survive among the nomadic tribes of the desert. Prof. Lindner therefore has appealed to scientists who may be in contact with such tribes to obtain a small sample of the solid for him, or even a few drops of the fermented liquid, so that he may examine it for the presence of *Termobacterium*.

"Even a few drops, concealed if necessary under the stamp on a postcard, would serve the purpose," he says.

Science News Letter, December 8, 1934



WHAT A WELL-DRESSED ROMAN HORSE WORE TO BATTLE

This modern horse, cautiously held by an Arab lest he revolt at his unaccustomed burden, is dressed in bronze armor that archaeologists have unearthed at Dura on the Euphrates. The armor was worn by a horse of Roman heavy cavalry, when Rome defended Dura against attacking Sassanians, 256 A.D.

ENGINEERING

Powerful Diesel Locomotives May Revolutionize Railroads

GIANT diesel-electric locomotives drawing swiftly and more economically standard passenger and freight trains of America's railroads were foreseen when Charles F. Kettering, leading research brain of General Motors, finished talking about diesel engines to the National Academy of Sciences at their Cleveland meeting.

Nearly ready to emerge from the Winton Cleveland shops are 3,600 horsepower diesels, which have four times the power of a similar engine in the now famous Union Pacific streamlined train. They will operate with an efficiency of 36 per cent., which makes the steam locomotive of today very uneconomical by comparison.

"Ket's" new diesels are travelling power plants that equal in efficiency the steam turbines used in large stationary electric generating stations.

With large diesel-electric locomotives capable of replacing steam engines and running without any changes in trackage upon existing railroad lines, the question arises as to whether this will make unnecessary the further electrification of American railroads and even economically obsolete the existing electrifications.

The principal trick in making such large diesels lies in the method of injecting the oil fuel into the cylinder where the heat of compressing the mixed vaporized fuel and air explodes the mixture without the aid of a spark, necessary in the gasoline engine. Kettering uses injection pressures fivefold those used in other diesels, 25,000 instead of 5,000 pounds per square inch. The injector is built close into the cylinder so that friction losses are few, and small charges of oil can be handled. No matter what the viscosity of the oil used, enough pressure can be applied to break it up into fine vapor through ten-thousandth-inch holes.

Science News Letter, December 8, 1934

It is estimated that there were about 50 million buffalo in North America at the beginning of the seventeenth century.

ARCHAEOLOGY

Find Temple of Mithras, Rival of Christian Faith

IN the ruins of Dura on the Euphrates, archaeologists from Yale and the French Academy have unearthed a temple to the great Persian god Mithras, favorite deity of the Roman legions, and one time rival of the Christian God in popular esteem.

"The importance of the discovery of the sanctuary of Mithras cannot be exaggerated," declared Dr. M. I. Rostovtzeff of Yale, one of the scientific directors of the expedition, announcing the latest revelations from the Mesopotamian city.

"Mithras was the greatest rival of Christ in the third century, A. D. In his pointed manner, the great E. Renan once said that were Christianity prevented from spreading by some accident, the religion of the modern world would be that of Mithras."

The temple, excellently preserved, is still decorated with bas-reliefs showing Mithras killing the bull, and engaged in other exploits of his career. The room where the soldiers of the Roman garrison at Dura once gathered to worship still contains two of the benches customary in Mithras' temples. On these benches the soldiers lay to partake of the sacred meals and to witness the sacred ceremonies performed by the magi.

In the Jewish synagogue, where previous digging revealed Bible paintings of the third century A.D., new scenes of the Old Testament have come to light. To this art gallery of Bible characters are now added Moses in the bulrushes, Queen Esther watching the triumph of Mordecai, Samuel annointing David, the Exodus of the Israelites, the story of Elijah, and other frescoes showing how people of 245 A.D. thought of these characters and incidents.

Dura's career lasted only five centuries, from about 280 B. C. to about 256 A.D. But in that time the city bore the imprint of five civilizations. Two more houses of worship have been found in this city of many religions. These are a Roman temple to Zeus and a temple of the Phoenician god Adonis and his consort Astarte.

Mines and counter-mines, evidence of the warfare when the Sassanians came to capture Dura from Rome, have been discovered. Bodies of the dead Roman defenders still with their armor and

weapons, have been unearthed. Opposite the Romans lay one Sassanian with his hand still raised and his sword near him.

"European scholars call Dura the Pompeii of the Euphrates," said Dr. Rostovtzeff, "and it deserves this name."

Science News Letter, December 8, 1934

METEOROLOGY

May Base Long-Range Weather Forecasting on Sea Warmth

POSSIBLE use of ocean temperatures, in conjunction with other factors, in forecasting air temperatures and precipitation along the middle and northern Atlantic seaboard has been suggested by Dr. Charles F. Brooks, director of the Blue Hill Meteorological Observatory of Harvard University, and Ernest M. Harwood of the Blue Hill research staff.

"It seems possible," says Dr. Brooks, "that the coastal waters may give indications of the air-temperatures of the following month along the Middle and North Atlantic seaboard, low sea-temperatures being followed by high air-temperatures, and vice versa. Furthermore it seems likely that the precipitation stands in inverse relationship to the general sea-temperature of the preceding month."

The data studied covered a five-year period during which sea temperatures were recorded on sea-water thermographs installed on commercial steamships in the western Atlantic, chiefly those sailing between New York and Bermuda. The land temperature and precipitation recordings were made at Boston and Baltimore, Md.

"The sea should have both a direct and an indirect influence on the coastal weather. The direct one should simply make the coast warmer and moister, when winds blow onshore off a sea warmer than usual, and vice versa," Dr. Brooks says.

The indirect effect works through the changes in general atmospheric pressure-distribution favored by departures of sea-temperature. When the sea is above normal in temperature it will not only heat the air but will also give it more vapor than usual. Such heated and humidified air is lighter than the average, and so the atmospheric pressure is lower. The lower pressure over the sea favors northerly land-winds, both cool and dry, on the coasts to the northwest. So a warm sea should favor subnormal temperature and precipitation, Dr. Brooks believes.

Conversely, with sea-temperature below normal the air would be denser, the pressure higher, and the wind consequently onshore from the south, bringing warmer and moister weather to the coasts. On the Atlantic seaboard, where the winds are prevailingly offshore, the direct influence must obviously be minor, therefore, the indirect should dominate.

"The sequences of departures of weather and sea-temperature do not show any striking opposition, so we cannot say that the problem of seasonal weather-forecasting from ocean-temperatures is solved," Dr. Brooks warns. "On closer examination, however, the expected inverse relationship is found to predominate rather consistently."

Science News Letter, December 8, 1934

PHYSICS

Two Automatic Instruments Facilitate Light Analysis

EXPECTED to be of tremendous assistance in the analysis of light, two new instruments are being developed at the Massachusetts Institute of Technology by Prof. George R. Harrison, director of the spectroscopy laboratory. Light analysis, or spectral analysis, is one of the most powerful of modern scientific weapons.

One of Prof. Harrison's instruments automatically measures and computes the wavelengths of spectrum lines, which are the separate bands that appear when a beam of white light is spread out by a prism or grating into an artificial rainbow. The other instrument, called an interval sorter, determines the energy of atoms and molecules from the spacing of these spectrum lines.

In measuring a spectrum by previous methods, the scientist observed by eye the distances of the spectrum lines from some standard line, using a delicate machine known as a comparator. For a spectrum photograph containing many of these lines the task might easily require days or even weeks. To avoid errors caused by temperature changes in the mechanism, each plate had to be measured several times and the results reduced by complex calculations.

Although the new machine for measuring wavelengths is still in the process of development, it makes measurements twenty times faster than by the conventional methods, and the results are twice as accurate. Further development is expected to make it 200 times faster than the old method. A beam of light supplants the human eye in recording the measurements by means of a photoelectric hookup. (*Turn Page*)

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The interval sorter speeds up the process of determining energy levels of spectra several hundred times, eliminating computations which in some instances total 100,000 in a single analysis. Prof. Harrison's machine makes automatic computations at the rate of 50,000 a minute, sorting out the wavelength intervals and recording them photographically at the same time.

Science News Letter, December 8, 1934

ARCHAEOLOGY

Tragedy Tale 150 Years Old Verified by CCC Digging

A TALE of Indian tragedy has been checked and found apparently true by excavations of CCC workers, under direction of the North Dakota State Historical Society.

A village of Mandan Indians, so the old story goes, stood on ground where Fort Abraham Lincoln later was built. But 150 years ago, the Mandans went down under a double-barreled dose of trouble. First smallpox swept the village. Then, the weakened community was visited by the thing it feared most, a raid of wild Sioux Indians. Relentless, the Sioux burned the village, and the few surviving Mandans fled to take refuge with another tribe.

Excavation seems to bear out this story, says George F. Will, an authority on Mandan Indians, who has taken an active part in the investigation.

"Very obviously the topmost layer of the houses was destroyed by fire, as there is a great deal of evidence to that effect. There are a quantity of human bones, showing that as many as four or five children and some grown women were thrown into storage pits, presumably then empty. Since the Mandans always buried the dead outside the village on scaffolds, this is very good evidence either of widespread epidemic or of enemy attack. As none of these skeletons show marks of injury, it is probable these were victims of smallpox."

MANDAN FIREPLACE FOR BOY SCOUT COUNCILS

This earth lodge, exactly like those Mandan Indians used to build, has been constructed on Indian foundations at Fort Lincoln State Park under supervision of North Dakota archaeologists. Scout meetings, picnics and other gatherings may be held round the Indian-style fireplace.

This village was inhabited when the Mandan culture was at its highest, the excavations reveal. Tremendous quantities of pottery of very high type are among the objects unearthed. Two fragments of pots are decorated with conventionalized turtles, which Mr. Will pronounces the first naturalistic designs ever discovered on Mandan pottery.

Nearly a bushel of good quality corn, well preserved by having been burnt over, was found in a village storage pit that was not cleaned out when the inhabitants were driven from home. This corn shows the braided husks and the ears, just as Indian women used to braid them to hang up for a reserve of seed corn.

A number of earth lodges such as the Mandans built are being erected in state park areas, for their historical interest, and these will be put to practical use for scout meetings, picnics and other gatherings. (*See SNL, Feb.* 14, 1931, *p.* 109).

Science News Letter, December 8, 1934

VITALISM
and
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PSYCHOLOGY-ECONOMICS

President Called Better Psychologist Than Economist

PRESIDENT Roosevelt is considered "a better practical psychologist" but "a more amateur economist" by Dr. J. McKeen Cattell, who describes himself as "a professional psychologist, who is an amateur economist."

Dr. Cattell writes under the title "A Scientific Approach to Emotional Problem." (*Scientific Monthly, December*). He is former professor of psychology in the University of Pennsylvania and Columbia University and is editor of *Science* and other journals. He says:

"It is alleged that one of those dubbed 'brain trusters' has asked what part of the body can be trusted better than the brain. The difficulty is that some of those in the saddles at Washington tend to trust the heart rather than the brain. A scientific approach to the emotional side of economic problems is not easy."

Discussing one phase of the economic situation and the new deal, Dr. Cattell says:

"It may be that in a period of depression work should be shared with the unemployed by prescribing a short day's work, though this is doubtful. As a permanent policy it would be disastrous. Before the industrial revolution most men, women and children worked twelve or more hours a day and got black bread, hovels and lice; people died at the average age of thirty years or earlier. Now, thanks to the applications of science and the better organization of society, child labor has become intolerable; eight hours of work for six days a week will provide the necessities and many of the comforts of life. The average length of life has been more than doubled.

"Thirty hours of work a week will today supply the necessities of life, but not the comforts. The hours should not be longer than is compatible with the health, happiness and efficiency of the worker, but it seems that he should be permitted to work thirty hours a week and live meagerly, or forty-five hours and have 50 per cent. more money, which could be used for bathtubs, telephones, radios, cars and children."

Science News Letter, December 8, 1934

OCEANOGRAPHY

Sargasso Sea Contains 10,000,000 Tons of Seaweed

THE Sargasso Sea, famed in legend as the "graveyard of lost ships," contains 10,000,000 tons of floating seaweed. This figure was arrived at through recent researches carried on by Prof. A. E. Parr, of the Bingham Oceanographic Laboratory at Yale University, which, in cooperation with the Woods Hole Oceanographic Institution, has been collecting data on the distribution and abundance of the drifting Sargasso weeds in the North Atlantic Ocean.

An expedition sponsored jointly by Yale and Woods Hole this season made long tows through the western part of the Sargasso Sea area, using nets of fixed dimensions in an effort to determine the quantity of floating weeds present so as to get a more solid foundation to work upon in the further study of the problems of the weeds and the animal life they harbor.

"The cumulative towing distance with these nets actually in the water is now over 2,000 nautical miles, and from the results of these tows we are able to say that the total amount of the floating Sargasso weeds covering the area of about 2,000,000 square miles between Bermuda, the Azores and the West Indies, must be expressed in millions of tons net weight, the actual amount being probably around 10,000,000 tons," Prof. Parr said.

"Though the accuracy of this figure is, of course, not very great as yet, it nevertheless represents a great step forward from the previous state of our knowledge about the Sargasso weed, when we were not even able to state with assurance whether we were dealing with tens or hundreds or thousands, millions or perhaps even billions of tons.

"Ten million tons of weeds, impressive as the figure may seem at first glance, is actually a very small quantity compared, for instance, with the plant growth on two million square miles of fertile land, which will yield about one billion tons per year or more, but it is nevertheless sufficient to provide for the existence of a unique and peculiar floating community of animals and plants which is now the subject of further investigations by the cooperating institutions."

Science News Letter, December 8, 1934

MEMORANDUM ABOUT CHRISTMAS:

What a friendly thing it is to say "MERRY CHRISTMAS."

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ZOOLOGY

NATURE RAMBLINGS
by Frank Thone

Cottontail

EVERY hunter's secret ambition is to kill a moose; his real hope is some day to shoot a deer; in actuality mostly he is content to go out and hunt rabbits. The settling up of this country, the shrinking of the forests and the spread of plowland, have removed the big game animals from the reach of large masses of the population; but the rabbit, being a rodent, has made its adaptability and its prolific rate of increase count in keeping it in existence in undiminished numbers in all of its old haunts. As a matter of fact, its numbers if anything have increased. Cottontail knows how to take toll of man's crops, and man has also befriended him by wiping out wolves and coyotes, discouraging foxes, and even by foolishly shooting hawks and owls.

Properly speaking, Cottontail is not a rabbit but a hare. Rabbits make burrows, whereas hares depend on their speed to outrun their enemies, and crouch for shelter in coverts of brush or down timber. There are no true rabbits in North America.

It looks now as though man is going to be compelled to let Cottontail run, lest in killing and eating him he do himself a grievous mischief. For the common carrier of the serious and yet wholly unconquered disease tularemia is the rabbit, and rabbits infested with tularemia have now been found in practically every state in the union. It is no longer safe to handle rabbits without rubber gloves, and it is decidedly unsafe to eat them unless they have been very thoroughly cooked.

Science News Letter, December 8, 1934

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PHYSICS

Cosmic Rays Deflected in Strong Electric Fields

A NEW method of analyzing cosmic rays—by deflecting them in intense electric fields—has been achieved by Dr. Ernst Lenz at the Physical Institute of the Technical College, Stuttgart, Germany. (*Nature, Nov.* 24). Dr. Lenz is a pupil and colleague of Prof. Erich Regener, world-famous cosmic ray authority.

If cosmic rays consist, in part, of electrical particles such particles should be deflected by both strong magnetic and electric fields. The deflection by magnetic fields has long been known but hitherto scientists have had difficulty in detecting the electric field deflection.

Using three Geiger-Müller counters to line up the axis of a corpuscular cosmic ray and a fourth counter to measure the angle of deflection, Dr. Lenz found that fields of 700 volts per centimeter were capable of deflecting the weaker and softer rays about four-tenths of an inch.

Very intense electric fields of 70,000 volts per centimeter were necessary to deflect the most penetrating rays. For the soft rays the displacement indicated a preponderance of particles bearing a positive charge of electricity. The strong, penetrating rays, however, showed a preponderance of particles carrying a negative electric sign.

From the deflection observed, it was possible to estimate the energy of the weak and strong components of the cosmic rays. The weak particles possessed an energy equivalent to 10,000,000 electron volts and the strong, penetrating particles energies of 2,000,000,000 volts.

The new method, Dr. Lenz indicates, "is considerably more convenient for the investigation of cosmic radiation than the use of magnetic fields."

With publication of reports from Germany it is revealed that research at the Bartol Research Foundation laboratories has been directed along similar lines in the past.

Prof. W. F. G. Swann, director of the Bartol laboratories, when informed of the achievement at Stuttgart, pointed out that in April, 1933, he and Dr. W. E. Danforth, Jr., reported to the National Academy of Sciences preliminary results of similar work.

Science News Letter, December 8, 1934

MARINE BIOLOGY

Goose Barnacles Exist, Though Not Hatching Geese

See Front Cover

SOMETIMES enlightenment overdoes itself; in banishing a superstition we fall victims to an equally unjustified incredulity. Thus many persons, aware of the discrediting of the old fable about geese being produced from "goose barnacles," think there is no such animal as a goose barnacle. They do exist, however; they are found abundantly adhering to pilings, ships' bottoms and other marine structures.

Their goose-shaped bodies, armored in shell, were responsible for the old belief. Actually they are molluscs, kindred of clams and oysters, squid and snails, though their peculiar mode of life has rendered them atypical in many respects.

Science News Letter, December 8, 1934

RADIO

Tuesday, December 11, 4:30 p. m.

CHRISTMAS TREES, By F. A. Silcox, Chief Forester, U. S. Forest Service.

Tuesday, December 18, 4:30 p. m.

PREVENTION OF FOOD POISONING, By Dr. Karl F. Meyer, Director, George Williams Hooper Foundation for Medical Research, University of California.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

First Glances at New Books

Additional Reviews On Page 368

Astronomy

THROUGH SPACE AND TIME—Sir James Jeans—*Macmillan,* 224 p., $3. Written in even a more popular spirit than *The Universe Around Us* and *The Background of Science* is this latest book by Sir James. Based on his Christmas lectures of 1933 before the Royal Institution, the material is "adapted for juvenile auditory" as the lectures advertise each year. Knowing the audience is, in reality, one which varies from eight to eighty, Sir James presented his topics accordingly. In space the book goes from the center of the earth to the distant nebulae, with stops at the atmosphere, the stratosphere, the sun, planets and stars. In time it goes from the creation of the earth a billion and a half years ago up to the present.

Science News Letter, December 8, 1934

Agriculture

WORLD WHEAT SURVEY AND OUTLOOK, SEPTEMBER 1934—Food Research Institute—*Stanford University,* 38 p., 50c.

Science News Letter, December 8, 1934

Child Training

TRAINING THE ADOLESCENT—Raphael C. McCarthy—*Bruce Pub. Co.,* 298 p., $2. Intended as a textbook for Catholic colleges. The author in his introduction says: "The reader will find frequent mention of the soul, the free will, and other realities that are either held in slight repute among the majority of present-day psychologists, or are conceived in a radically different sense from that in which we employ them. I make no apologies for them."

Science News Letter, December 8, 1934

Physiology

AN INTRODUCTION TO HUMAN PHYSIOLOGY—Lathan A. Crandall—*Saunders,* 325 p., $2. Developed from a lecture course given to student nurses, this book is designed as a text for students who have completed their preparation for college. The subject is very fully covered in this small volume and is presented clearly and simply with an emphasis on the practical aspects and on the medical applications of modern discoveries in physiology. It seems an excellent text for an introductory course for college students. Adults lacking the opportunity of college training but wishing to learn for themselves the "phenomena of life and the functions of living things" might also find this book worth studying, though it lacks, of course, the complete simplification and sugar-coating of a popular book on the human body.

Science News Letter, December 8, 1934

Bibliography

GOOD READING—Ed. by Atwood H. Townsend—*National Council of Teachers of English,* 72 p., single copies 15c.; 10 or more, 10c. each. A reading list of nine hundred significant books, prepared originally for college students, but useful for adult readers anywhere. It is arranged conveniently by subject.

Science News Letter, December 8, 1934

Medicine

MORTALITY AMONG PATIENTS WITH MENTAL DISEASE—Benjamin Malzberg—*State Hospitals Press,* 234 p., $1.50. Statistics on mental disease gathered during the past 25 years by the New York State Department of Mental Hygiene were drawn upon for this analytical study. Mortality among patients with mental disease is compared with mortality in the general population of New York State. The findings will be of considerable interest to physicians specializing in the treatment of mental disease and also students of public health problems.

Science News Letter, December 8, 1934

Hygiene

HEALTH WORKBOOK FOR COLLEGE FRESHMEN — Kathleen Wilkinson Wootten—*A. S. Barnes,* 220 p., $1.50. This is not a textbook but a combination of study course outline and notebook for the student's use and guidance in what would be an extensive course in personal hygiene and public health. Numerous references are given, presumably to supplement the information to be given in lectures.

Science News Letter, December 8, 1934

Astronomy

THE UNIVERSE AROUND US (3d ed., rev.)—Sir James Jeans—*Macmillan,* 380 p., $4. As Sir James points out in his preface, much has happened in the three years which have passed since the second edition of this nonfiction best seller. Whole new worlds at both the microscopic and macroscopic ends of the scale of size have been discovered. There are new and bigger nebulae for the astronomer to puzzle over just as there are the neutron and positron for the atomic physicist. The new edition, rewritten in many places, tells most of the major discoveries. The only exception is the heavy hydrogen isotope and its oxide, heavy water. Since a Nobel Prize has been awarded for this discovery one can imagine that Sir James regrets the omission as much as the reader will regret not reading what Sir James thinks about it.

Science News Letter, December 8, 1934

Education

THE DEVELOPMENT OF MODERN EDUCATION—Frederick Eby and Charles F. Arrowood—*Prentice-Hall,* 922 p., $3.50. A textbook on the history of education intended by the authors for professional training rather than general cultural reading.

Science News Letter, December 8, 1934

Anatomy

HUMAN ANATOMY, DOUBLE DISSECTION METHOD—Dudley J. Morton—*Columbia University Press,* 2 vol., 550 p., $3.00. An outline of laboratory procedure for medical students.

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Child Care

HEALTHY BABIES ARE HAPPY BABIES—Josephine H. Kenyon—*Little, Brown,* 321 p., $1.50. This book by an authority on child care should prove a helpful guide to the young mother. It tells her what to expect and what to do for her own and her child's welfare from the time of conception through the child's third year.

Science News Letter, December 8, 1934

Zoology

WONDERS OF ANIMAL LIFE: Animal Life in the British Isles; Animal Life in Africa; Animal Life in the East; Animal Life in the New World; Bird Lands; Animal Friends—F. M. and L. T. Duncan—*Oxford University Press,* 6 vol., each vol. 65c. A series of neatly gotten out nature readers for the lower grades. The very fact that they are of British origin may make their supplementary use in American schools of real advantage; children might well be taught early that there are other points of view beside the local one.

Science News Letter, December 8, 1934

Botany

WONDERS OF PLANT LIFE: The Story of the Plants; Plants and Their Children; Land and Water Plants; Plant Traps and Decoys; Some Curious Plants; Plant Friends and Foes—F. M. and L. T. Duncan—*Oxford University Press,* 6 vol., each vol. 65c. Elementary plant biology, but with such careful selection of principles and such clear exposition that a roomful of school children who master these small books will be turned, without realizing it, into a veritable college of young ecologists and plant physiologists.

Science News Letter, December 8, 1934

Medicine

AMERICAN MEDICINE—Henry E. Sigerist—*Norton,* 316 p., $4. Here is an entire volume, and a most interesting one, devoted to medical progress in America. Since the subject is never presented so fully and so critically in the usual history of medicine, the patriotic reader will particularly appreciate this book. It is the more interesting because it is written from the European viewpoint, though this is not to say that Dr. Sigerist is unsympathetic or unimpressed by American achievements in medicine. On the contrary, it was his enthusiasm over what he found on his first visit to America that led him to start this book immediately upon his return to Germany. It was finished after his return to this country to become William H. Welch professor of the history of medicine at Johns Hopkins University. The history of medicine in America is as thrilling as any chapter in American history and, according to Dr. Sigerist, has world-wide significance. He says that the future of medicine will be determined by the United States and Russia. Forward-looking persons will therefore do well to look with him over the past achievements to see what has brought this country to its present position as a medical power.

Science News Letter, December 8, 1934

Entomology

WONDERS OF INSECT LIFE: Butterflies and Moths; Bees, Wasps and Ants; Beetles and Flies; In Pond and Stream; Curious Insects; Spiders and Scorpions—F. M. and L. T. Duncan—*Oxford University Press,* 6 vol., each vol. 65c. Though produced for use in Great Britain, these books treat of so many cosmopolitan genera and species that they will be useful on this side of the ocean as well.

Science News Letter, December 8, 1934

Marine Biology

WONDERS OF THE SEA: Wonders of the Shore; The Lobster and His Relations; The Star Fish and His Relations; Dwellers in the Rock-Pools; Life in the Deep Sea; The Sea Birds—F. M. and L. T. Duncan—*Oxford University Press,* 6 vol., each vol. 65c. These books are published in Britain; but the sea runs round the world, and the animals and plants here told about are cosmopolitan.

Science News Letter, December 8, 1934

Medicine

FIRST AID AFIELD—Paul W. Gartner—*Macmillan,* 115 p., $1.25. First aid directions for sportsmen, illustrated by photographs taken by the author.

Science News Letter, December 8, 1934

Roentgenology

THE HEART VISIBLE—J. Polevski—*F. A. Davis Co.,* 207 p., 122 illustrations, $5. How X-ray and fluoroscopic studies of the heart and large blood vessels may be used in the study of the heart and diagnosis of heart disease is presented here. A technical book, for physicians.

Science News Letter, December 8, 1934

Hygiene

COMMUNITY HYGIENE—L. B. Chenoweth and W. R. Morrison—*F. S. Crofts & Co.,* 317 p., $2.50. A text book designed to teach college students the principles of public health. Leaving details to other more specialized science courses, this book nevertheless covers the subject completely, giving briefly types, causes and methods of preventing communicable diseases, and includes a chapter on public health administration. It might well form the basis of adult study courses outside of colleges.

Science News Letter, December 8, 1934

Education

A DEMONSTRATION OF INDIVIDUALIZED TRAINING METHODS FOR MODERN OFFICE WORKERS—Edward G. Eriksen, Isabelle Gillilland, Agnes J. Kean, Gertrude Page and Gertrude L. Hawkins—*University of Minnesota Press,* 62 p., $1.00. One of the bulletins of the Employment Stabilization Research Institute.

Science News Letter, December 8, 1934

Medicine

REVIEW OF MEDICAL PROGRESS, 1934—George M. Piersol, editor-in-chief—*F. A. Davis Co.,* 1009 p., $10. Designed to help the busy practicing physician keep abreast of medical progress by compiling for him the important advances reported in the multitude of medical journals. Too technical for the layman, of course.

Science News Letter, December 8, 1934

Medicine

ELECTROPYRIXIA IN GENERAL PARALYSIS—Leland E. Hinsie and Joseph R. Blalock—*State Hospitals Press,* 90 p., $1.25. This monograph is a review of experience with electrically-induced fever for the treatment of general paralysis.

Science News Letter, December 8, 1934

Pharmacology

THE MATHEMATICS OF DRUGS AND SOLUTIONS—Harrly C. Biddle and Disa W. Sitler—*F. A. Davis,* 47 p., $3 for package of five. This is a workbook designed to supplement textbooks on drugs and solutions for schools of nursing.

Science News Letter, December 8, 1934

Preventive Medicine

ANNUAL REPORT—Rockefeller Foundation, 447 p., free.

Science News Letter, December 8, 1934